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ERP use

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ERP use: exclusive or complemented?

ERP use:
exclusive or
complemented?

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Abstract

Purpose – The purpose of this paper is to provide insight into the antecedents of ERP use and use of alternative software packages simultaneously.

Design/methodology/approach – An exploratory model was composed based on literature on adoption and diffusion of innovations in general and ERP in specific. The model was tested using a sample of 486 Dutch mid-sized enterprises of the electrical, engineering and metal industries. Using two regression analyses we identify the effect of ERP related factors on ERP adoption and the simultaneous use of alternative software solutions.

Findings – ERP adoption is significantly related to ERP complexity (positive), ERP compatibility (negative), IT competence (negative), and ERP sellers' marketing efforts (positive). For the ERP adopters that also use other software packages the following relationships were significant: ERP's additional flexibility, ERP compatibility (positive), IT competence (positive), ERP sellers' marketing efforts (negative), and company size.

Research limitations/implications – As any sample, ours is limited and the findings may be validated among other populations. In-depth qualitative research may help gaining deeper insights into actual decision processes.

Practical implications – Companies considering investing in ERP are aware of the influence sellers might have; companies should consider alternatives to ERP systems to overcome flexibility problems emanating from ERP use. This will most likely help to maintain their competitive advantage in the marketplace. It will require some internal IT competence to help make the right decisions, i.e. balance need for integration of software and product/service differentiation towards customers.

Originality/value – This is the first paper on the issue of the exclusive use of ERP systems versus the simultaneous use of alternative packages.

Keywords Manufacturing resource planning, Computer software, Innovation, Competences, Communication technologies, The Netherlands

Paper type Research paper

Introduction

Despite the substantial investments involved and the often far-reaching economic, organizational, and social consequences, the use of ERP systems shows continuous growth (Al-Mashari, 2003; Huang *et al.*, 2004a, b). The magnitude of ERP's managerial implications has resulted in many publications on purchasing motivations and implementation problems encountered (McAdam and Galloway, 2005). These include many reports about disappointing results of ERP system implementation and performance (Ho *et al.*, 2004; Howcroft *et al.*, 2004; Trimi *et al.*, 2005). The apparent contrast between widespread use on the one hand, and frequently occurring disappointments on the other hand, leads one to wonder what drives ERP system adoption. Organizations can also choose for less encompassing and thus less complex and cheaper information system alternatives. Compared to ERP systems, these are often custom-built with a better fit to local situations. Moreover, the latter may help to



preserve the user organization's unique characteristics, thereby maintaining or enhancing its competitive advantage more effectively (Benders *et al.*, 2006a).

ERP systems may be used in combination with other information systems. *Prima facie* this seems improbable as the very logic of ERP systems is to integrate dispersed information systems. However, as our empirical data show joint use is simply an empirical fact. There appears to be no literature on why ERP users also use other information systems, yet the topic is worthy of investigation. To explore this issue we formulated as key question:

What ERP related factors influence an organization's use of ERP systems and their simultaneous use of additional information systems?

In the next section, we discuss the history and nature of ERP systems. Subsequently, we discuss our conceptual framework. We draw on extant literatures on the adoption and diffusion of innovations (Tornatzky and Fleischer, 1990; DiMaggio and Powell, 1983; Rogers, 1995) to build a framework on ERP adoption. After detailing our methodological approach, we use the framework analyzing a sample of Dutch midsized enterprises in machine-tool industries. We end by discussing our key findings, presenting research suggestions and managerial and research implications.

ERP systems

ERP systems are integrative software systems. The ideal is to use one single organizational information system for all separate organizational functions in combination with a common database. The generic history of ERP systems tends to be portrayed as follows. ERP systems have their origin in the late 1970s and early 1980s when computers started being used to support production planning. The logistic control concept "material requirements planning" or "MRP" was to become the basis for what evolved into ERP systems. Based on a production plan MRP systems could calculate when and what quantities of components were needed to ensure efficient production control. MRP was soon extended to include other functions such as capacity planning and master production scheduling based on sales forecasting. These were known as "MRP II" or manufacturing resources planning (Rondeau and Litteral, 2001; Gupta *et al.*, 2004; Okrent and Vokurka, 2004).

The next step involved coupling and integrating different functional information systems. In contrast to what the conventional history suggests, these information systems had been developed for a variety of organizational functions such as accounting, human resource management (HRM) and finance. Market leader SAP started off in accounting, while competitor Oracle is originally a database specialist. The package "PeopleSoft" refers to its roots in HR information systems. The problem was that these information systems operated independently of each other, resulting in "island automation." Inefficiencies such as extensive data entry work and data inconsistencies led to attempts to effectively link these separate software systems. Software companies started to develop packaged software offering integrated solutions for several control functions. Computer hardware developed simultaneously. Apart from increasingly powerful computers, database management systems offered a powerful tool to support the desired integration. All ERP software packages more or less ran through the following development stages. Starting from financial accounting, logistic functions, database management, project management or HRM and pay roll

systems, software suppliers started their integration attempts to develop ERP software. Using a common basis the suppliers generally first introduced several key modules and then extended their product/service range. A relatively new development concerns the mastering of supply chain management, thereby integrating external parties into the system, including customer relationship management, project control, HRM, quality management, workflow management and even knowledge management (Frank, 2004; Huang *et al.*, 2004a, b). Apart from generalists such as SAP and Oracle serving various markets, there are sector- and country-specific ERP-software packages such as REMS, a Dutch software package dominating the local market for real-estate management (De Jong, 2006). However, all ERP systems operate using a single database and support multiple organizational functions.

Conceptual framework

Adoption refers to an organization's decision to start using an innovation. Diffusion refers to the cumulative number of organizations that has adopted the instrument over time. In the literature extensive attention has been paid to the explanation of innovation adoption decisions (Rogers, 1995). Since, an innovation is defined as "an idea, practice, or object that is perceived as new by an individual or other unit of adoption" (Rogers, 1995) the findings from the innovation adoption literature may also be useful when studying firms' adoption of ERP systems.

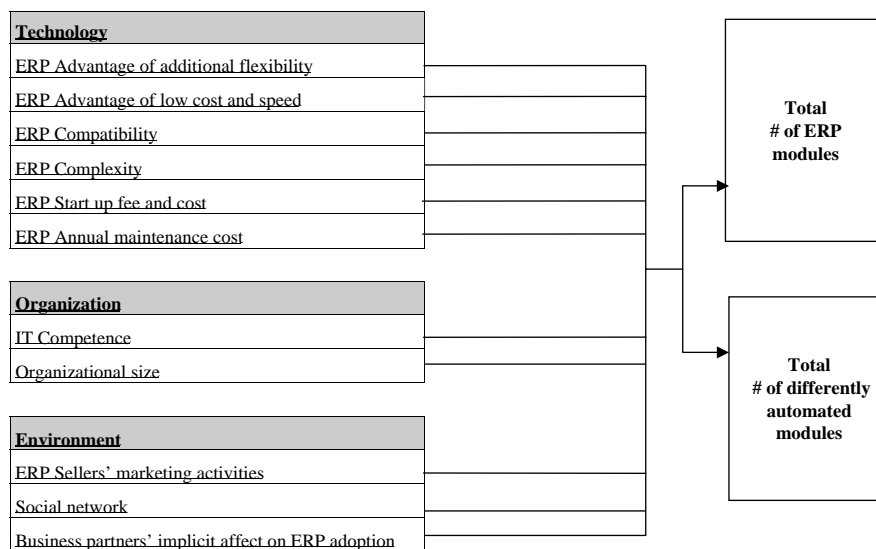
In a review of the literature of organizational innovation adoption, Tornatzky and Fleischer (1990) provided a framework for adoption identifying three sets of variables influencing the propensity to adopt an innovation. These include:

- (1) the new technology;
- (2) the characteristics of the organization; and
- (3) its market environment and social network.

We briefly discuss these three sets and apply them to ERP systems and their alternatives (Figure 1).

The first set of antecedents includes the relative advantage that an organization anticipates from adopting the innovation but also perceived attributes of the innovation such as its compatibility with current organizational processes and its level of complexity (Rogers, 1995). The relative advantage of ERP involves the benefits versus the costs of the system (Martin *et al.*, 2002). The benefits of ERP systems include, for instance, the integration of formerly scattered functional information systems in a single architecture; centralization of organizational activities; an enterprise-wide access to one shared database; integration of geographically dispersed subsidiaries in multinational firms; and including suppliers and/or customers in one's value chain and value conceptualization (Hong and Kim, 2002; Poston and Grabski, 2001; Al-Mashari, 2003; Rajagopal, 2003). The underlying benefits, positively influencing an organization's competitive positioning, are decreased manufacturing cost, and increased flexibility and speed (Spathis and Constantinides, 2003; Elbertsen and van Reekum, 2005). The cost of purchasing an ERP system involves start up cost and cost of annual maintenance. High start up fees and fees for annual maintenance may reduce the propensity to adopt the technology. Perceived complexity and compatibility of the new technology with existing systems is also anticipated to affect

Figure 1.
Conceptual framework of
the influence of perceived
adoption characteristics
on ERP adopters' number
of ERP modules and
differently automated
modules



the adoption decision. More complex and less compatible technologies decrease the chance of adoption (Rogers, 1995).

The second set of antecedents of adoption involves organization characteristics. Limiting ourselves to key variables, IT competence and organization size are included. An organization is expected to consider, evaluate, and select a new technology based on the knowledge it has of this technology (Cohen and Levinthal, 1990). More IT competent organizations will be better able to understand the technology and thus experience less uncertainty during the adoption decision. Furthermore, knowledgeable organizations may be more aware of ERP software limitations and decide for a customized solution rather than standardized software like ERP. Organization size has been identified as a surrogate variable of several organizational dimensions (e.g. organization structure and level of formalization) influencing adoption (Rogers, 1995). Large organizations are more likely to benefit from ERP adoption and have a higher absorption capacity for such a comprehensive tool.

Finally, we also include variables related to the organization's external environment and social network. In accordance with Frambach (1993) and Rogers (1995), we include the marketing efforts of providers in the market place. Intense marketing efforts may increase the awareness for the new technology and increases the propensity to adoption. Consistent with DiMaggio and Powell (1983) the influence from the organization's social network such as peers and clients is included. In the literature much attention has been given to how organizations adopt ERP to conform to pressure from their business partners and meet quality standards following evolving formal industry standards. More social and institutional pressure is associated with a higher tendency to adopt ERP systems (Benders *et al.*, 2006a).

We anticipate that all three sets of variables influence ERP adoption and also affect the degree to which firms decide to use or keep using alternative software solutions next to their integrated ERP system. As most of these antecedents are well researched we do not formally pose hypotheses for them. We further anticipate differential effects

between ERP adoption versus the choice for alternative solutions but treat this as an empirical question. Yet, in general we anticipate that positive ERP adoption characteristics will be negatively related with alternative solution usage (e.g. flexibility of ERP system will be positively be correlated with ERP adoption and negatively with adoption of alternative solutions) while negative ERP adoption characteristics will positively be correlated with alternative solution usage (e.g. annual cost of ERP system will negatively affect ERP adoption but positively alternative solutions).

Data and methodology

The data were gathered in The Netherlands using a mail survey. Our sampling frame existed of 486 mid-sized firms in the machine parts/products, metal and electronic industries able to make independent decisions on investments in automation and ERP software. A questionnaire was sent to the CEO of each company using a personalized letter requesting for cooperation with the research. He/she was filled in the questionnaire or passed it on to the person best qualified to do so. In return cooperating firms were promised a summary of the study results. To further stimulate the response rate a telephone-reminder was used.

After four weeks, 144 questionnaires had been returned. After subtracting non-users (who had also been asked to send back their questionnaires) and those without alternative systems, and after correcting for incomplete questionnaires and responses not meeting other requirements (most importantly: firm size) we were left with a useable set of 86 companies. Taking into account the distribution of users and non-users it suggested a gross and net response rate of 31.7 and 23.5 percent, respectively. A brief sample profile is shown in Table I. All users have at least one differently automated module. The highest number of alternative solutions used to complement an ERP system was nine. The median and average scores were 3 and 4.8 modules, respectively.

Almost half of the companies in our sample belong to the machine industry (46.5 percent) and fall in the range of 50-200 employees (76.3 percent). Most questionnaires were filled out by IT and application/system managers, followed by CEOs. Of the ERP users over 50 percent purchased the current software between 1997 and 2002.

The questionnaire was pre-tested in two steps. First, we collected suggestions from two consultants. Next, we pre-tested the questionnaire using two users of ERP software. This resulted in some changes in the sequencing of questions and some more explicit formulations and instructions.

Measurement

All independent variables were operationalized using multiple items. A detailed description of the measures used can be obtained from the first author. Factor analyses were used to check the constructs dimensionality while Cronbach α 's were computed as a measure for construct reliability. Reliability coefficients for multiple-item measures and other measurement properties are reported in Table II.

The correlation matrix for the independent variables (Appendix) was then examined for interrelationships among variables. The highest correlation was between "ERP sellers" marketing activities' and influence of "Social network" ($r = 0.35$, $p < 0.01$). The low level of correlations suggested that multicollinearity would not represent a problem in the subsequent analyses.

Industry	Company size (number of employees)		Organization type	Respondent's function		Year of adoption	Subset: ERP users (<i>n</i> = 86)		Number of ERP workstations		
							current ERP system				
Machinery	47.7	50-99	40.7	Independent	55.8	IT and application/ systems managers	45.3	1991	8.1	1-19	3.5
Metal Electronics	33.7	100-149	36.0	Subsidiary	44.2	CEO	26.7	1992-1996	25.6	20-39	37.2
	16.8	150-199	17.4		Financial manager	22.1	1997-2002	54.7	40-59	23.3	
		200-249	5.8		Other	5.9	2003	11.6	60-79	10.5	
										≤80	25.5

Note: All numbers in percent, *n* = 86

Construct	Number of items	Mean	SD	Cronbach's α
<i>Technology</i>				
ERP advantage of additional flexibility	2	3.06	0.82	0.73
ERP advantage of low cost and speed	6	2.96	0.60	0.78
ERP compatibility	2	3.56	0.93	0.88
ERP complexity	6	3.29	0.71	0.83
ERP start-up fee and cost	3	3.61	0.58	0.64
ERP annual maintenance cost	3	2.60	0.86	0.79
<i>Organization</i>				
Company size (number of employees)	1	2.88	0.90	NA
IT competence	3	3.59	0.66	0.61
<i>Environment</i>				
ERP sellers' marketing activities	4	3.77	0.57	0.65
Social network	4	3.17	0.69	0.76
Business partners' implicit affect on ERP adoption	4	3.16	0.79	0.86

Note: NA – not applicable

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Table II.
Means, standard
deviations and reliability
of study constructs
($n = 86$)

In accordance with our framework two dependent variables were included, assessing the level of adoption of ERP and alternative software solutions used. They were operationalized by the number of ERP modules and the number of alternative software modules used, respectively. Rather than ask respondents directly for these numbers we asked them for a wide range of business processes whether these had been automated and if so using which type of software, i.e.

- ERP based;
- other standard package (not using their ERP platform);
- customized solution; and
- self-developed software solution.

The mean number of modules used was 10.6 with 7.8 (SD = 2.0) and 3.8 (SD = 2.0) ERP and alternative modules, respectively.

Analysis

The data were analysed by examining the distribution of responses based on frequencies and percentages. Next, hierarchical regression analyses were conducted. A first regression used the number of ERP modules as the dependent variable and the 11 independent variables mentioned previously. The level of independence of the company was included as a control variable. A second regression was done with the same independent variables but using the total number of alternative software packages as the dependent construct. In both cases, two cases were identified as outliers and dropped (Table III).

Results

Four of our 11 independent variables were associated significantly with ERP adoption, i.e.

- (1) ERP complexity;
- (2) ERP compatibility;

Table III.
Regression results
regarding the influence of
perceived adoption
characteristics on ERP
adopters' number of ERP
modules and number of
differently automated
modules

Independent variables	ERP users (<i>n</i> = 86)			Dependent variable		
	Total number of ERP modules			Total number of differently automated modules		
	β	<i>t</i> -value	<i>p</i>	β	<i>t</i> -value	<i>p</i>
Constant		1.9	0.06		−0.2	0.86
<i>Technology</i>						
ERP advantage of additional flexibility	0.13	1.2	0.23	−0.21	−1.9	0.06
ERP advantage of low cost and speed	0.09	0.8	0.42	0.06	0.5	0.60
ERP compatibility	−0.27	−2.5	0.02	0.32	2.9	0.01
ERP complexity	0.27	2.3	0.03	−0.08	−0.7	0.50
ERP start-up fee and cost	0.05	0.4	0.68	0.14	1.3	0.21
ERP annual maintenance cost	−0.15	−1.3	0.21	0.07	0.6	0.56
<i>Organization</i>						
Company size	−0.01	−0.1	0.90	0.36	3.2	0.00
IT competence	−0.34	−3.2	0.00	0.21	2.0	0.05
<i>Environment</i>						
ERP sellers' marketing activities	0.35	3.1	0.00	−0.29	−2.6	0.01
Social network	0.02	0.2	0.84	0.09	0.7	0.47
Business partners' implicit affect on ERP adoption	−0.08	−0.7	0.48	−0.07	−0.6	0.54
<i>Control variable</i>						
Subsidiary	−0.11	−1.0	0.30	0.11	1.1	0.29
Model fit	Adj <i>R</i> ² = 0.19, <i>F</i> = 2.6, <i>p</i> < 0.006			Adj <i>R</i> ² = 0.19, <i>F</i> = 2.6, <i>p</i> < 0.007		

- (3) IT competence; and
- (4) Marketing activities of resellers/providers.

Perceived ERP complexity was positively correlated with adoption while compatibility was negatively correlated. This seems strange as it suggests that people who think ERP systems are complex and incompatible adopt more. IT competence is negatively correlated with ERP adoption. More knowledgeable people show a lower tendency to adopt ERP systems. ERP providers marketing activities were clearly positively related to ERP adoption. It suggests providers' marketing activities are effective. The picture that emerges from these results is that less knowledgeable people, who think ERP complex and not very compatible, are more receptive to providers' marketing efforts and have a higher propensity to adopt ERP systems.

For the ERP adopters that use other software packages as well we noted five significant effects. IT competence was positively correlated with the simultaneous adoption and use of alternative solutions. These systems are compatible with the ERP system as suggested by the positive coefficient between ERP system compatibility and number of alternative module used. ERP sellers' marketing efforts also had a significant effect. They decreased the level of alternative modules a user operated significantly. Furthermore, ERP flexibility perceptions also negatively correlated with the adoption of alternative solutions. This suggests that alternative modules are more

adopted when the ERP system does not allow enough flexibility. In that case users tend to resort to alternative solutions, probably in order to maintain or improve their competitive position in the marketplace. Finally, mainly larger firms seem to apply alternative software solutions in combination with their ERP system.

Not significant on both accounts were the independent variables of system cost (start up and maintenance). Probably, the decisions for ERP use are considered a necessity. Managers have the feeling they need to conform to industry development. Further, variation on cost between systems may be limited explaining why these variables do not play a role in the choice for one or the other, i.e. ERP and/or alternative solutions. Although we cannot see a tendency in the data that maintenance cost are more important for ERP packages and start up cost for customized/alternative solutions, these effects were not significant and thus should not be interpreted. Cost and speed advantages also did not play a role. The same holds for social pressures from peers and supply chain partners.

Finally, both regressions explained approximately 20 percent of variance in the dependent variable. This suggests that other factors, not included in this research, influence these decisions.

Discussion

The results showed that managers who perceive ERP as more complex and less compatible adopt more ERP modules. This result is consistent with the outcome that users who declared themselves as less competent tend to possess more ERP modules than their more knowledgeable counterparts. These less competent managers seem more prone to ERP vendors' marketing activities which also significantly affected the number of ERP modules adopted. First, ERP vendors may convince less IT competent managers more easily that a standard ERP package is the best IT solution in their case. Second, once the owner of a particular ERP platform these customers may be locked into the relationship and adopt even more modules more willingly. However, why do the more IT competent users in general choose for alternative solutions such as tailor-made and/or self-developed software? Three possible explanations come to mind. Firstly, respondents who declare themselves as IT competent are or at least feel more knowledgeable about IT. They feel confident in choosing and using other systems. In this case, the IT competent organizations come to a well-considered choice not to use ERP but to adopt an alternative solution instead. Secondly, IT competent firms are more sceptical about ERP sellers' marketing activities, realizing that implementing an ERP system does not automatically lead to better performance (Gulledge and Simon, 2005). Reports about troublesome implementation projects and only partially fulfilled sales promises may play a role (Ho *et al.*, 2004; Elbertsen and van Reekum, 2005). Third, the use of alternatives and, therefore, non-standard software may lead to a built-up of knowledge and help to reach and safeguard an organization's competitive positioning. Purchasing and operating unique software requires substantial IT skills. Identifying IT (in a particular functional area) as a key distinctive competence will help prevent erosion of competitive advantage from interacting with ERP consultants who next take the newly developed ideas to a competitor for exploitation or even worse – help to integrate the ideas into a new generation or ERP release.

The results showed a counter intuitive finding that companies that perceive standard ERP modules as less compatible and more complex adopt more rather than

less of these modules. This can be explained and understood based on the aim to incorporate “best practices” in ERP modules (Benders *et al.*, 2006a). These best practices hold the promise that together with implementing an ERP system, business processes are improved according to what are held to be superior ways of performing certain operational processes. In this perspective, an ERP system is not just any “IT solution” but a state-of-the-art form of organizational advancement. However, this means that an ERP implementation goes along with organizational changes, which increases the complexity of using an ERP system.

Having more standard ERP modules and at the same time perceiving these modules as rather complex may be explained because the integration philosophy of ERP systems involves coupling organizational functions which increases organizational complexity. That large companies have more alternative software modules in combination with their ERP system seems logical based on the size/scope of the automation problem these organizations face. It also would seem given the resources they have. Large organizations are more likely to be able to carry the cost of customized software solutions than small companies. Furthermore, small companies may be so busy trying to deal with their ERP problems that they lack (both managerial and financial) resources to carefully consider the options of automating particular functions in a different way. Recognizing this effect may be important to find new avenues for competitive advantage by scanning carefully processes that may contribute to a more unique market position through using complementary but ERP “deviant” software solutions.

Limitations and suggestions for further research

In the first place, longitudinal qualitative research is needed to investigate the suggested causal links of our conceptual framework in general and between self-declared IT competencies and use of software packages in particular.

Second, additional drivers of adoption of ERP and alternative modules should be looked at. As noted, our framework was based largely on the general adoption literature, and used many generic factors. As is always the case with specific cases and innovations (Ogbonna and Harris, 2005), using general frameworks runs the risk of overseeing factors which appear idiosyncratic from a generic point of view yet are crucial for the specific case at hand. In the case of ERP systems, these reasons may include the (perceived) need for organization-wide standardization, for instance when newly acquired units need to be integrated, and the desire to implement the “best practices” embedded in ERP systems (Wagner and Newell, 2004). Detailing further, the issue arises whether there are differences in this between ERP-packages. The IT history of a firm may also be given more attention in future adoption studies (Martin, 2005).

Third, we treated the use of alternative software solutions in combination with ERP software as an empirical question and found widespread use of both types of systems simultaneously. This phenomenon was explained because companies may have to respond to two different kinds of pressures, i.e. they need to comply with external standards and demands from stakeholders such as customers, competitors and suppliers on the one hand, but face the need to differentiate their products and service in the marketplace on the other hand. Combining institutional theory and the resource-based view perspective may be a good starting point to investigate this further (Deephouse, 1999; Oliver, 1997).

Fourth, follow-up research is needed to study the relationship between “pure” ERP users and “ERP plus” users. The first group was not present in our study, but also better understanding this group will be beneficial. Further, although we noted a relationship between organizational size and complementary use of alternative solutions, a learning process may be involved. Companies may adopt ERP to get rid of a jungle of separate, island like software/automation solutions. Next, they may find themselves trapped in a standardized ERP harness and react by searching for avenues to escape this situation. The solution may be to carefully consider and adopt some alternative software solutions for key functional areas that help create new competitive advantages in the marketplace.

Managerial implications

It is a truism that investments in IT in general and ERP systems in particular have been substantial. At the same time, horror stories about “failures” and implementation “challenges” exist. Much of these unwanted results can be traced back to the complexity of ERP systems. The strength of ERP systems lies in integrating modules by coupling them. At the same time, this strength can be considered its weakness. The close coupling of modules means less responsiveness to the local requirements in particular functional areas. In addition, ERP systems’ complexity makes them hard to control and expensive to manage. To reduce the complexity and thereby increase the manageability, managers should carefully consider when to couple IT systems and when to better de-couple them in the light of competitive advantage in the marketplace. Strategic considerations should be explicitly taken into account when purchasing and implementing software. Furthermore, if separate systems are maintained, should they be coupled to the ERP systems or be operated as stand-alone applications? Full integration may appear attractive, yet the large amount of “close couplings” this involves means complex and thus expensive systems. Their centralistic effect may easily be at odds with policies promoting local decision-making and “empowerment” (Koch and Buhl, 2001; Trimi *et al.*, 2005; Benders *et al.*, 2006b). Making these judgements will require a certain level of IT competence in the organization. However, this competence would seem necessary also for being able to resist ERP providers’ marketing efforts. Managers should be able to distinguish between wishful thinking and real ERP benefits. There appears to be an unquestioned dogma among IT-professionals that a maximum level of automation is desirable. Yet “cui bono”? Who benefits from raising automation levels? IT vendors and IT staff do, but does the organization also? Rather than simply accepting the implicit assumption managers considering investments in ERP should understand and investigate and thus need also a basic level of IT knowledge themselves.

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The appendix follows overleaf.

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Table AI.
Correlation matrix

	ERP compatibility	ERP complexity	IT competence	ERP start-up fee/cost	ERP annual cost	ERP sellers' marketing activities	Business partners' influence	Social network	ERP advantage (flexibility)	ERP advantage (cost/speed)	Company size
ERP compatibility	1.00										
ERP complexity	0.19	1.00									
IT competence	0.08	0.23	1.00								
ERP start-up fee/cost	-0.09	-0.19	-0.03	1.00							
ERP annual cost	-0.19	-0.34	-0.11	0.32	1.00						
ERP sellers' marketing actv.	0.06	-0.01	0.19	0.01	0.13	1.00					
Business partners' influence	0.28	0.13	0.05	-0.25	-0.14	0.12	1.00				
Social network	0.12	0.21	0.18	0.02	0.04	0.35	0.26	1.00			
ERP advantage (flexibility)	0.02	0.20	0.08	-0.01	-0.13	-0.16	0.11	0.07	1.00		
ERP advantage (cost/speed)	-0.06	-0.02	0.05	-0.06	-0.13	-0.01	-0.02	-0.05	0.28	1.00	
Company size	-0.22	-0.33	-0.10	-0.01	0.06	-0.01	0.13	-0.14	-0.01	-0.03	1.00

Note: Above diagonal correlations of non-users and below the diagonal correlations of users are reported